PLANT AND CELL PHYSIOLOGY

EDITORIAL BOARD

Masaki FURUYA

Faculty of Science University of Tokyo, Tokyo

Hirosi HUZISIGE

Faculty of Science Okayama University, Okayama

Masayuki NAGAO

Faculty of Science Tohoku University, Sendai

Atsushi TAKIMOTO*

Faculty of Agriculture Kyoto University, Kyoto

Toshio YAMAKI

College of General Education University of Tokyo, Tokyo Eiji HASE

Institute of Applied Microbiology University of Tokyo, Tokyo

Noburô KAMIYA

Faculty of Science Osaka University, Osaka

Yukito OOTA

Faculty of Science Nagoya University, Nagoya

Ikuzo URITANI

Faculty of Agriculture University of Nagoya, Nagoya

Tomomichi YANAGITA

Institute of Applied Microbiology University of Tokyo, Tokyo

(* : Editor-in-chief)

Volume 9 1968

Japanese Society of Plant Physiologists Tokyo, Japan The publication of this journal has been supported in part by financial aid from the Ministry of Education.

CONTENTS

No. 1, March, 1968

Veiga, L. A.: Phosphorylation and acetylation of glucosamine in germi-	
nating mung bean seeds	1
Kumagai, T., Y. Fujii and H. Takahashi: Ammonia as an important	
nitrogen source for the photosynthetic growth of Rhodospirillum	
rubrum	13
Whitton, B. A.: Effect of light on toxicity of various substances to	
Anacystis nidulans	23
Näf, U.: On separation and identity of fern antheridiogens	27
Noguchi, M., A. Koiwai, M. Yokoyama and E. Tamaki: Studies on	
nitrogen metabolism in tobacco plants IX. Effect of various com-	
pounds on proline biosynthesis in the green leaves	35
SAKANO, K., T. ASAHI and I. URITANI: Heterogeneity of mitochondrial	
particles in fresh and wounded tissues of sweet potato roots	49
Kamisaka, S. and Y. Masuda: Auxin-induced growth of tuber tissue	
of Jerusalem artichoke IV. Significance of gibberellin biosynthesis	
and basic proteins in chromatin in aging process	61
Oshio, Y. and E. Hase: Studies on nucleic acids in the chloroplasts	
isolated from Chlorella protothecoides	69
MIHARA, S., K. KIMURA and E. HASE: Studies on ribonucleic acids from	
Chlorella protothecoides with special reference to the degradation	
of chloroplast RNA during the process of "glucose-bleaching"	87
Syōno, K. and T. Furuya: Studies on plant tissue cultures I. Relation-	400
ship between inocula sizes and growth of calluses in liquid culture	103
Takebe, I., Y. Otsuki and S. Aoki: Isolation of tobacco mesophyll cells	115
in intact and active state	115
TOOLE, V. K. and H. A. BORTHWICK: The photoreaction controlling seed	105
germination in Eragrostis curvula	125
Short communications	
INOUYE, J. and K. Ito: Flower initiation in total darkness in long-day	
plant, Hordeum vulgare L. var. nudum Hook. f	137
Asada, K., R. Deura and Z. Kasai: Effect of sulfate ions on photo-	20,
	143
MADISON, M. and L. RAPPAPORT: Regulation of bud rest in tubers of	
potato, Solanum tuberosum L. V. Abscisic acid and inhibitors of	
	147
MIYATA, K., M. AOYAMA and M. NAGAHISA: A phenolic pigment as a	
hydrogen carrier in p-lactate cytochrome c reductase system of a	
	155
, 0	

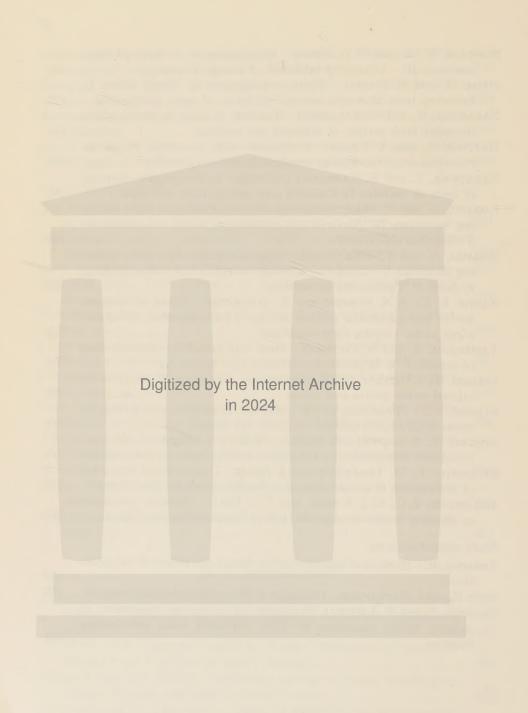
No. 2, June, 1968

HONGLADAROM, T., S.I. HONDA and S.G. WILDMAN: Swelling of spinach	
chloroplasts induced by HCHO and KMnO4, an effect partially	
hidden by the wide size range of chloroplasts	159
Mino, Y.: Studies on the destruction of indole-3-acetic acid by a species	
of Arthrobacter I. On the induction of the enzyme responsible for	
the destruction	169
ASADA, K., K. TANAKA and Z. KASAI: Phosphorylation of myo-inositol	
in ripening grains of rice and wheat. Incorporation of phosphate-32P	
and myo-inositol-3H into myo-inositol phosphates	185
PORATH, E. and A. POLJAKOFF-MAYBER: The effect of salinity in the	
growth medium on carbohydrate metabolism in pea root tips	195
Mino, Y.: Studies on the destruction of indole-3-acetic acid by a species	
of Arthrobacter II. Properties of the oxidation system	205
KHALIFA, M. D. E. and J. A. LIPPINCOTT: Promotion of crown-gall tumor	
initiation on primary pinto bean leaves by certain inorganic salts	217
Tsukamoto, Y. and S. Matsubara: Studies on germination of chrys-	
anthemum pollen I. Effect of sugars on germination	227
Tsukamoto, Y. and S. Matsubara: Studies on germination of chrys-	
anthemum pollen II. Occurrence of a germination-promoting sub-	
stance	237
Nakashima, H.: On the rhythm of sensitivity to light interruption in	
a long-day duckweed, Lemna gibba G3	247
Окоloko, G. E. and L. N. Lewis: Enhancement of lateral bud growth	
in Coleus blumei Benth. by (2-chloroethyl) trimethylammonium	
chloride (CCC)	259
Yamashita, T. and T. Horio: Non-cyclic photophosphorylation by spinach	
grana treated with 0.8 m Tris buffer	267
FENWICK, E. L. and D. E. G. SHEAT: Growth responses of sunflower	
hypocotyl disks inoculated with Escherichia coli and Agrobacterium	005
tumefaciens I. Morphological observations	285
FENWICK, E. L. and D. E. G. SHEAT: Growth responses of sunflower	
hypocotyl disks inoculated with Escherichia coli and Agrobacterium	005
tumefaciens II. Analyses of increases in weight	295
SPLITTSTOESSER, W.E.: The absorption of potassium and several organic	207
Compounds by barley roots: Effect of siduron	307
presence of colchising	015
presence of colchicine Yanagishima, N., C. Shimoda, S. Kamisaka and T. Takahashi: Auxin-	315
induced heritable variants in yeast with special reference to physi-	
ological and genetic characters	323
Endo, T.: Indoleacetate oxidase activity of horseradish and other plant	020
peroxidase isozymes	333
VANDERHOEF, L. N. and J. L. Key: Inhibition by kinetin of cell elonga-	000
tion and RNA synthesis in excised soybean hypocotyl	343

ROBERTS, L. W. and S. BABA: Effect of proline on wound vessel member formation	353
TAZAWA, M. and U. KISHIMOTO: Cessation of cytoplasmic streaming	333
of Chara internodes during action potential	361
Wada, S., E. Tanimoto and Y. Masuda: Cell elongation and metabolic	
turnover of the cell wall as affected by auxin and cell wall degrading	0.00
enzymes	369
DALAL, K. B., D. K. SALUNKHE, L. E. OLSON, J. Y. Do and M. H. Yu:	311
Volatile components of developing tomato fruit grown under field	
and greenhouse conditions	389
Short communications	
KURAISHI, S., K. KASAMO and T. HAYASHI: Effect of auxin on the	
incorporation of proline into the naked protoplasm of Chara	401
globularis	401
bound and chloroplastic starch synthetase	405
Suge, H. and Y. Murakami: Occurrence of a rice mutant deficient in	100
gibberellin-like substances	411
No. 3, September, 1968	
Guss, P.L., V. Macko, T. Richardson and M.A. Stahmann: Lipoxidase	
in early growth of wheat	415
Nanda, K. K. and R. S. Dhindsa: Effect of gibberellic acid on starch	110
content of soybean (Glycine max L.) and its correlation with exten-	
sion growth	423
ITO, A. and A. FUJIWARA: The relation between calcium and cell wall	
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf	423
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf	
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf	433
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf	433
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration	433
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation	433
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation of DNA and on the increase on deoxythymidine monophosphate	433
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation of DNA and on the increase on deoxythymidine monophosphate kinase activity in <i>Chlorella protothecoides</i> . Bowen, J. E.: Borate absorption in excised sugarcane leaves	433 441 451
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation of DNA and on the increase on deoxythymidine monophosphate kinase activity in Chlorella protothecoides. Bowen, J. E.: Borate absorption in excised sugarcane leaves. Cutler, H. G. and L. R. Krusberg: Plant growth regulators in Ditylen-	433 441 451 461 467
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation of DNA and on the increase on deoxythymidine monophosphate kinase activity in Chlorella protothecoides. Bowen, J. E.: Borate absorption in excised sugarcane leaves. Cutler, H. G. and L. R. Krusberg: Plant growth regulators in Ditylenchus dipsaci, Ditylenchus triformis and host tissues.	433 441 451 461
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation of DNA and on the increase on deoxythymidine monophosphate kinase activity in Chlorella protothecoides. Bowen, J. E.: Borate absorption in excised sugarcane leaves. Cutler, H. G. and L. R. Krusberg: Plant growth regulators in Ditylenchus dipsaci, Ditylenchus triformis and host tissues. Nobel, P. S.: Energetic basis of the light-inducd chloroplast shrinkage	4333 4411 4511 4611 4677
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation of DNA and on the increase on deoxythymidine monophosphate kinase activity in Chlorella protothecoides. Bowen, J. E.: Borate absorption in excised sugarcane leaves. Cutler, H. G. and L. R. Krusberg: Plant growth regulators in Ditylenchus dipsaci, Ditylenchus triformis and host tissues. Nobel, P. S.: Energetic basis of the light-inducd chloroplast shrinkage in vivo.	433 441 451 461 467
Ito, A. and A. Fujiwara: The relation between calcium and cell wall in growing rice leaf. Koyama, N., M. Aoyama and M. Nagahisa: Development of catalase activity in yeast in relation to growth and respiration. Minamikawa, T., I. Oyama and S. Yoshida: Alicyclic acid metabolism in plants 2. Enzymes related to the shikimate pathway in developing mung bean seedlings. Sokawa, Y. and E. Hase: Suppressive effect of light on the formation of DNA and on the increase on deoxythymidine monophosphate kinase activity in Chlorella protothecoides. Bowen, J. E.: Borate absorption in excised sugarcane leaves. Cutler, H. G. and L. R. Krusberg: Plant growth regulators in Ditylenchus dipsaci, Ditylenchus triformis and host tissues. Nobel, P. S.: Energetic basis of the light-inducd chloroplast shrinkage	4333 4411 4511 4611 4677

Konishi, K., T. Ogawa, M. Itoh and K. Shibata: Minor carotenoid components in the chloroplasts of higher plants	519529539555
Short communications RAI, V.K. and M.M. LALORAYA: Effect of inhibitors of protein synthesis on the gibberellin induced hypocotyl growth in lettuce MATSUBARA, S. and Y. TSUKAMOTO: Studies on germination of chrys-	561
anthemum pollen III. Substance promoting germination	565 573
dwarf mutants $(d_1 \text{ and } d_5)$	577
tous ion	583
glucan α -4-glucosyltransferase from tubers of Jerusalem artichoke Cutler, H. G. : Growth-regulating properties of ten straight chain esters	587
of indole-3-acetic acid	593
during the greening of bleached cells of <i>Chlorella protothecoides</i> Honda, Y., M. Sakamoto and Y. Oda: Blue and near ultraviolet reversible photoreaction on the sporulation of <i>Helminthosporium</i>	599
oryzae:	603
thaliana	609
NISHIZAKI, Y.: Rhythmic changes in the resting potential of a single plant cell	613
No. 4, December, 1968	
Ketring, D. L., R. E. Young and J. B. Biale: Effects of monofluoro- acetate on <i>Pencillium digitatum</i> metabolism and on ethylene biosyn- thesis	617
Yu, M. H., D. K. Salunkhe and L. E. Olson: Production of 3-methyl-	
butanal from L-leucine by tomato extract	633
excised Begonia fragments cultured in vitro Suzuki, Y. and N. Таканаsні: Effects of after-ripening and gibberellic acid on the thermoinduction of seed germination in Solanum melongena	639
g	653

Schwalb, M. N. and P. G. Miles: Morphogenesis of Schizophyllum	
commune III. Activity of inhibitors of energy metabolism	661
SUGAI, M. and M. FURUYA: Photomorphogenesis in Pteris vittata II.	
Recovery from blue-light-induced inhibition of spore germination	671
NAKAMURA, T. and N. TAKAHASHI: The role of auxin in growth of the	
plumular hook section of etiolated pea seedling	681
HATTORI, A. and I. UESUGI: Purification and properties of nitrite	
reductase from the blue-green alga Anabaena cylindrica	689
KANAZAWA, T. and K. KANAZAWA: Changes in composition patterns	
of basic of proteins in Chlorella cells during their life cycle	701
KODAMA, A. and T. Mori: Studies on the metabolism of a sulfur-oxidiz-	
ing bacterium IV. Growth and oxidation of sulfur compounds in	
Thiobacillus thiooxidans	709
KODAMA, A. and T. Mori: Studies on the metabolism of a sulfur-oxidiz-	
ing bacterium V. Comparative studies on sulfur and sulfite oxidizing	
systems of Thiobacillus thiooxidans	725
NANDA, K. K., A. N. PUROHIT and K. MEHROTRA: Effect of sucrose,	
auxins and gibberellic acid on rooting of stem segments of Populus	
nigra under varying light conditions	735
YAMASHITA, T. and A. FUJIWARA: Some further studies on metabolism	
of acetate-1-14C in potassium deficient rice leaves	745
IMASEKI, H., I. URITANI and M. STAHMANN: Production of ethylene by	
injured sweet potato root tissue	757
IMASEKI, H., T. TERANISHI and I. URITANI: Production of ethylene by	
sweet potato roots infected by black rot fungus	769
STURANI, E., S. Cocucci and Marré: Hydration dependent polysome-	
monosome interconversion in the germinating caster bean endosperm.	783
Кітамото, Ү., М. Таканаsні and Z. Kasai: Light-induced formation	
of fruit-bodies in a basidiomycete, Favolus arcularius (Fr.) Ames	797
McLeester, R. C., C. J. Weiser and T. C. Hall: Seasonal variations	
in freezing curves of stem sections of Cornus stolonifera Michx	807
Short communications	
TERAOKA, H.: Histones of wheat embryos during the period of vernaliza-	819
tion	825
Suge, H. and L. RAPPAPORT: Promotion of flowering by helminthosporol	020
ZOLOTOV, Z. and Y. LESHEM: Promotion of α-amylase production of	
isolated barley aleurones by RNA extracted from germinating	831
embryos	001



AUTHOR INDEX

Aiga, I	599	Khalifa, M. D. E	217
Akazawa, T	405	Kimura, K	87
Aoki, S	115	Kishimoto, U361,	539
Aoyama, M155,	441	Kitamoto, Y	797
Asada, K143,	185	Kodama, A	725
Asahi, T	49	Koiwai, A	35
Baba, S315,	353	Konishi, K.	519
Banerjee, S. N	577	Koyama, N	441
Biale, J. B	617	Krusberg, L. R	479
Borthwick, H. A.	125	Kumagai, T	13
Bowen J. E.	467	Kuraishi, S	401
Cardini, C. E.	587	Laloraya, M. M	561
Cocucci, S		Lavintman, N	587
Cutler, H. G		Leshem, Y	831
Dalal, K. B.	389	Lewis, L. N.	259
Deura, R.	143	Lin, C. Y.	553
Dhindsa, R. S.	423	Lippincott, J. A	217
Do, J. Y	389	Macko, V	
Endo, T		Madison, M	
Fenwick, E. L		Majima, R	511
Fujii, Y	13	Marré, E	783
Fujiwara, A	745	Masuda, Y	369
Furuya, M	671	Matsubara, S227, 237,	565
Furuya, T	103	McLeester, R. C	807
Guss, P. L	415	Mehrotra, K	735
Hall, T. C.	807	Mihara, S	87
Hase, E69, 87,	461	Miles, P. G	661
Hattori, A		Minamikawa, T	451
Hayashi, T	401	Mino, Y	205
	159	Miyata, K	155
Honda, S. I.	159	Mori, T709,	725
Honda, Y	603	Murakami, Y	
Horio, T	267	Näf, U	27
Iguti, S	573	Nagahisa, M	441
Imaseki, H757,	769	Nakamura, T	681
Inouye, J	137	Nakashima, H	247
Ito, A	433	Namiki, M	511
Ito, K	137	Nanda, K. K	735
Itoh, M	519	Nishizaki, Y	613
Kamisaka, S61,	323	Nitsch, J. P	
Kanazawa, K	701	Nobel, P. S.	499
Kanazawa, T	701	Noguchi, M	
Kasai, Z		Oda, Y	
Kasamo, K	401	Ogawa, M	
Ketring, D. L		Ogawa, T	
Ketring, D. L		Okayama S	

Okoloko, G. E	259	Takahashi, H	13
Oku, T		Takahashi, M	797
Olson, L. E389,	633	Takahashi, Noriko	681
Oshio, Y	69	Takahashi, Norindo	653
Otsuki, Y	115	Takahashi, T	323
Oyama, I	451	Takebe, I	115
Poljakoff-Mayber, A	195	Tamaki, E	35
Porath, E	195	Tanaka, K	185
Purohit, A. N	735	Tanaka, Y	405
Rai, V. K	561	Tanimoto, E	369
Rappaport, L	825	Tazawa, M	361
Rehwaldt, C. A.	609	Teranishi, T	769
Richardson, T	415	Teraoka, H	819
Ringe, F	639		125
Roberts, L. W	353	Tsukamoto, Y	565
Saito, K	529	Uesugi, I	689
Sakamoto, M	603	Umebayashi, M	583
Sakano, K	49	Uritani, I	769
Salunkhe, D. K	633	Vanderhoef, L. N	343
Sasa, T	599	Veiga, L. A	1
Schwalb, M. N	661	Wada, S	369
Sheat, D. E. G	295	Weiser, C. J.	807
Shibata, K	519	Whitton, B. A	23
Shimoda, C	323	Wildman, S. G	159
Sokawa, Y	461		745
Splittstoesser, W. E	307	Yamashita, Takashi	267
Stahmann, M. A	757	Yanagishima, N	323
Strani, E	783	Yokoyama, M	35
Sugai, M	671	Yoshida, S	
Suge, H	825	Young, R. E	617
Suzuki, Y	653	Yu, M. H	
Syōno, K	103	Zolotov, Z	831

Instructions for Contributors

to

PLANT AND CELL PHYSIOLOGY

(Revised December 1968)

- 1. Contributors to PLANT AND CELL PHYSIOLOGY are required to hold membership in the Japanese Society of Plant Physiologists.
- 2. Papers should be written in English, French or German. Submission of three copies of the manuscript is requested.
- 3. The length of an ordinary paper should be less than 12 printed pages, and that of a short communication less than 4 printed pages. When papers exceed these limits, the author will be charged at cost for the extra pages. Two double spaced typewritten pages (pica type) correspond approximately to 1 page of print.
- 4. **Manuscripts should be typewritten** with double spacing throughout and margins of about 3 cm on all sides. A margin of about 5 cm should be left, between the author's address and Summary, to insert the received date of the paper. The location of figures and tables in the text should be indicated with pencil in the right margin.
 - 5. Manuscripts should be arranged as follows:
 - (i) Title of article (Give the English title in parentheses when the paper is written in French or German)
 - (ii) Author's name and institution
 - (iii) Summary (Full paper, 100-200 words; Short communication, less than 50 words)
 - (iv) Text
 - (v) Acknowledgements
 - (vi) References
 - (vii) Tables
 - (viii) Legends for figures
 - (ix) Figures

Authors should give, on a separate sheet:

- (i) a short version of the title, not exceeding 50 letters and spaces
- (ii) the name and address for mailing editorial correspondence including galley proofs and reprint order forms
- (iii) the number of figures and tables

Number all pages consecutively (including tables and legends) in the upper right corner.

- 6. **Texts** should be prepared (except short communications), as far as possible, under the headings of Introduction, Materials and methods, Results and Discussion. Consult recent issues of PLANT AND CELL PHYSIOLOGY for paragraph headings and subheadings.
- 7. Tables should be prepared in a form consistent with recent issues of PLANT AND CELL PHYSIOLOGY. Vertical rules are not permited. Tables should be numbered consecutively with Arabic numerals. Explanatory material should be given in table footnotes rather than in the heading. The footnotes should be referred to by superscript figures: a, b, c,... Each table should be written on a separate page.
- 8. Figures drawn with India ink on white paper are preferable. For better appearance of graphs, the top and right sides are preferably boxed in by lines of the same weight as the abscissa and ordinate. Figures drawn clearly with pencil on graph paper will also be accepted. The author is requested to pay the expense for tracing. Figures should be numbered consecutively with Arabic numerals. Two additional copies of

each set of figures are requested for manuscript review. Each figure should be identified with the author's name and the number of figure. Figure legends should not be attached to the figures. The printed size of figures will be determined by the editors. Special paper for the reproduction of photographs may be used at the author's expense.

9. Text references should be made by italicized Arabic numerals enclosed in parenthesis in the order of appearance. For the style of References, consult examples given

below and recent issues of PLANT AND CELL PHYSIOLOGY.

(1) Hodges, T.K. and J.B. Hanson. Calcium accumulation by maize mitochondria. Plant Physiol., 40, 101-108 (1965).

- (2) Vidaver, W. and C.S. French. Oxygen uptake and evolution following monochromatic flashes in Ulva and an action spectrum for system I. ibid., 40, 7-12 (1965).
- (3) Kornberg, A. Adenosine phosphokinase. In Methods in Enzymology 2. Edited by S. P. Colowick and N. O. Kaplan. p. 497–500. Academic Press Inc., New York, N. Y. (1965).
- 10. **Footnotes** should be referred to by superscript figures in serial numbers throughout the text and written at the bottom of respective pages.
- 11. **Abbreviations** used (except the common chemical symbols and exceptions noted below) should be illustrated at the bottom of the first page without a reference mark.
- 12. Letters to be printed in italic, gothic and small capital forms should be indicated by single, wavy and double underlines, respectively.
- 13. Authors are responsible for reading galley proofs. Any major change from manuscript will be charged.
- 14. Authors will receive 50 reprints without covers free of charge; additional copies can be obtained at cost upon request.

Manuscripts should be sent to: Dr. Atsushi Takimoto, Laboratory of Applied Botany, Faculty of Agriculture, Kyoto University, Kyoto, Japan.

Abbreviations commonly used in PLANT AND CELL PHYSIOLOGY

5'-diphosphates of adenosine, cytidine, guanosine, inosine, uridine adenosine 5'-phosphate, etc. adenosine 5'-triphosphate, etc. ampere centigrade centimeter(s) coenzyme A and its acyl derivatives concentration (in tables) counts per minute Curie deoxyribonuclease deoxyribonucleic acid ethylenediaminetetraacetate Figure(s) flavin adenine dinucleotide and its reduced form flavin mononucleotide gram(s) gravity

AMP, etc. ATP, etc. amp °C

ADP, CDP, GDP, IDP, UDP

CoA and acyl-CoA

cpm Ci DNase DNA EDTA Fig.

FAD and FADH₂

 $\begin{array}{c} {\rm FMN} \\ {\rm g} \\ \times {\it g} \end{array}$

```
hour(s)
                                                         hr
kilogram(s)
                                                         kg
liter(s)
                                                         spell out
meter(s)
                                                         m
Michaelis constant
                                                         Km
microcurie(s)
                                                         u.Ci
microgram(s)
                                                         μg
microliter(s)
                                                         \mu l
micromolar(s) (unit of conc, \( \mu \) mole/liter)
                                                         \mu M
micromole(s) (unit of mass)
                                                         umole(s)
microvolt(s)
                                                         \mu v
microwatt(s)
                                                         \mu w
millicurie(s)
                                                         mCi
milligram(s)
                                                         mg
milliliter(s)
                                                         ml
millimeter(s)
                                                         mm
millimicron(s)
                                                         m\mu
millimolar (unit of conc, mmole/liter)
                                                         mM
millimole(s) (unit of mass)
                                                         mmole(s)
millivolt(s)
                                                         mv
minute(s)
                                                         min
molar (mole/liter)
                                                         M
mole(s) (a gram molecule)
                                                         spell out
nicotinamide adenine dinucleotide and its
                                                         NAD and NADH2 (or NAD+ and
     reduced form
                                                             NADH + H^+)
nicotinamide adenine dinucleotide phosphate
                                                         NADP and NADPH2 (or NADP+
     and its reduced form
                                                             and NADPH+H+)
normal (conc)
                                                         N
normal (in trivial names in organic compounds)
                                                         n-
                                                         No.
optical density (optical density at 260 \text{ m}\mu)
                                                         OD (OD260)
orthophosphate
                                                         P_i
part(s) per million
                                                         ppm
percent
                                                         %
precipitate (in tables)
                                                         ppt
                                                         PP;
pyrophosphate
revolutions per minute
                                                         rpm
ribonuclease
                                                         RNase
ribonucleic acid
                                                         RNA
second(s)
                                                         sec
supernatant (in tables)
                                                         sup
                                                         Tris
tris (hydroxymethyl) aminomethane
ultraviolet
                                                         UV
volt(s)
                                                         V
                                                         v/v
volume/volume (conc)
watt(s)
                                                         W
                                                         w/v
weight/volume (conc)
weight/weight (conc)
                                                         w/w
For isotopes, use 14C, 35S instead of C14, S35.
```

The metric system is adopted as standard: If English measures are to be used for any reason, metric equivalents must be supplied in parentheses.